west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2837
Plant ID No.:	041-00011
Applicant:	Dominion Transmission, Inc.
Facility Name:	Kennedy Station
Location:	Lewis County
SIC Code:	4922
Application Type:	Modification
Received Date:	April 13, 2010
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$1,000
Date Received:	April 15, 2010
Complete Date:	April 26, 2010
Due Date:	July 23, 2010
Applicant Ad Date:	April 14, 2010
Newspaper:	*The Weston Democrat*
UTM's:	Easting: 543.59 km Northing: 4,328.71 km Zone: 17
Description:	Permitting of the existing dehydration unit flare as a control device.

DESCRIPTION OF PROCESS

The following process description is *nearly* verbatim from the permit application:

The Kennedy Station is a compressor facility that services a natural gas pipeline system. The purpose of the facility is to recompress natural gas flowing through a pipeline for transportation. The compressor engines (EN02 and EN03) at the facility receive natural gas from a valve on a pipeline and compresses it to enable further transportation in the pipeline. Prior to entering the pipeline, the compressed natural gas is processed by the dehydration unit. The purpose of the dehydration unit is to remove moisture from the gas stream to comply with gas quality specifications. The process to remove the moisture begins with the compressed gas being passed through a triethylene glycol dehydration system consisting of a contactor bed, a reboiler (RBR01), and associated equipment. During this process a small amount of hydrocarbons are extracted from the gas stream. The wet gas enters the contactor where moisture and some hydrocarbons are absorbed

into the lean glycol. The glycol which has become rich with absorbed moisture and hydrocarbons, is regenerated in the still column (DEHY) using the heat generated in the natural gas fired reboiler to liberate the moisture and hydrocarbon vapors. The regenerator vapors are vented to the flare (F1) to combust the hydrocarbons, thereby reducing overall emissions and odor. The compressed, dehydrated gas then enters the pipeline.

This modification involves permitting the existing flare (F1) as a control device with 95% destruction efficiency.

SITE INSPECTION

A full on-site inspection was last performed by the WVDAQ on June 3, 2009. On that date Mike Kolb found the facility to be "in compliance." To get to the facility take I-79 north to the Jane Lew exit (105) and turn right on County Route 7. Then go 0.8 miles and turn left on US Route 19 and travel 5 miles to County Route 12. Turn right onto County Route 12 and travel 2.5 miles and bear left (road changes to Country Route 10). Travel 0.6 miles to the intersection with Country Route 1. Turn left onto Country Route 1 and travel 200 yards to Valley Chapel Road. Turn right onto Valley Chapel Road and travel 1.3 miles to the station which is on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions from the flare should be as follows:

	lb/hr	tpy
NO_x	0.20	0.90
CO	1.11	4.87
PM	0.03	0.10
SO_2	0.01	0.01
VOC	4.81	21.03
Benzene	0.05	0.19
Ethylbenzene	0.04	0.17
Hexane	0.02	0.10
Toluene	0.17	0.73
Xylene	0.62	2.70
Total HAPs	0.90	3.90

DTI has estimated that uncontrolled VOC emissions from the dehy would be 420.68 tons per year. Therefore this application represents a decrease of 399.7 tons per year.

REGULATORY APPLICABILITY

The following state and federal regulations apply to the modification:

STATE RULES:

45CSR2 Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

The permittee is subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

45CSR4 To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

45CSR6 To Prevent and Control the Discharge of Air Pollution from Combustion of Refuse

The flare (F1) is subject to 45CSR6. 45CSR6, Section 4.1, limits the allowable PM emissions from the flare to 0.26 pounds per hour (based on the flare combusting 96.05 pounds per hour of VOCs). The flare's proposed emission rate is 0.03 pounds per hour. Therefore, the permittee will meet this rule.

The flare is also subject to the 20% opacity limitation in section 4.3 of this rule. Typically, the incineration of most gases produce minimal visible emissions.

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

The facility voluntarily applied for this permit in order to make the flare a federally enforceable control device and therefore become a "synthetic minor" for the purposes of 40 CFR 63.

45CSR30 Requirements for Operating Permits

DTI is an existing major source subject to 45CSR30. Changes authorized by this permit must also be incorporated into the facility's Title V operating permit. Commencement of the operations

authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.

Additionally, with the issuance of this permit the facility has become a "synthetic minor" for HAPs. Therefore no major source provisions of 40 CFR 63 will apply to the facility.

It should be noted that when determining major source status for the purposes of MACT, the compressor engines and dehy system are considered separately since this facility is upstream of a natural gas processing plant.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The following information was obtained from USEPA's Air Toxic Website.

Hexane

Hexane is used to extract edible oils from seeds and vegetables, as a special-use solvent, and as a cleaning agent. Acute (short-term) inhalation exposure of humans to high levels of hexane causes mild central nervous system (CNS) effects, including dizziness, giddiness, slight nausea, and headache. Chronic (long-term) exposure to hexane in air is associated with polyneuropathy in humans, with numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue observed. Neurotoxic effects have also been exhibited in rats. No information is available on the carcinogenic effects of hexane in humans or animals. EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity.

Benzene

Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

Ethylbenzene

Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term)

exposure to ethylbenzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene. Limited information is available on the carcinogenic effects of ethylbenzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethylbenzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity.

Toluene

Toluene is added to gasoline, used to produce benzene, and used as a solvent. Exposed to toluene may occur from breathing ambient or indoor air. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of pregnant women exposed to toluene or mixed solvents by inhalation. Reproductive effects, including an association between exposure to toluene and an increased incidence of spontaneous abortions, have also been noted. However, these studies are not conclusive due to many confounding variables. EPA has classified toluene as a Group D, not classifiable as to human carcinogenicity.

Xylene

Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethylbenzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACT ANALYSIS

Because this is a minor modification to a major stationary source no modeling was performed.

MONITORING OF OPERATIONS

The permittee will be required to perform the following monitoring:

1. Monitor and record the amount of gas consumed by the flare

2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location

3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.

4. Maintain records of the visible emission opacity tests conducted per the permit.

5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-2837 for the modification of a compressor station near Valley Chapel, Lewis County, be granted to Dominion Transition Inc.

Steven R. Pursley, PE
Engineer

Date